Name:

at1121exam_practice: Radicals and Squares (v610)

Question 1

Simplify the radical expressions.

$\sqrt{28}$ $\sqrt{8}$ $\sqrt{45}$

$\sqrt{2 \cdot 2 \cdot 7}$ $\sqrt{2 \cdot 2 \cdot 2}$ $\sqrt{3 \cdot 3 \cdot 5}$

$2\sqrt{7}$ $2\sqrt{2}$ $3\sqrt{5}$

Question 2

Find all solutions to the equation below:

$$\frac{(x-7)^2 - 6}{2} = 15$$

First, multiply both sides by 2.

$$(x-7)^2 - 6 = 30$$

Then, add 6 to both sides.

$$(x-7)^2 = 36$$

Undo the squaring. Remember the plus-minus symbol.

$$x - 7 = \pm 6$$

Add 7 to both sides.

$$x = 7 \pm 6$$

So the two solutions are $x = 13$ and $x = 1$.

Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 - 16x = -55$$

$$x^2 - 16x + 64 = -55 + 64$$
$$x^2 - 16x + 64 = 9$$
$$(x-8)^2 = 9$$
$$x - 8 = \pm 3$$
$$x = 8 \pm 3$$
$$x = 11 \quad \text{or} \quad x = 5$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 4x^2 - 40x + 91$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 4 .

$$y = 4(x^2 - 10x) + 91$$

We want a perfect square. Halve -10 and square the result to get 25 . Add and subtract that value inside the parentheses.

$$y = 4(x^2 - 10x + 25 - 25) + 91$$

Factor the perfect-square trinomial.

$$y = 4((x-5)^2 - 25) + 91$$

Distribute the 4.

$$y = 4(x-5)^2 - 100 + 91$$

Combine the constants to get **vertex form**:

$$y = 4(x-5)^2 - 9$$

The vertex is at point $(5, -9)$.